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| ANTONELLI, TERRY, STOUT & KRAUS, LLP | | | GONZALEZ, HIRAM E | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/585,461 | TAKETATSU ET AL. | |
| | Examiner | Art Unit | |
| | HIRAM E. GONZALEZ | 2835 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 19 January 2012.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
- 4) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) Claim(s) 1-50 is/are pending in the application.
 - 5a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 6) Claim(s) _____ is/are allowed.
- 7) Claim(s) 1-50 is/are rejected.
- 8) Claim(s) _____ is/are objected to.
- 9) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 10) The specification is objected to by the Examiner.
- 11) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ . | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 12, 13, 15, 16, 19-22, 35-38, 41-44, and 47-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama et al. US 4,999,460.

Regarding Claims 1-3, Sugiyama et al. teaches:

- an adhesive composition and covered particles (elements 21 & 22, Fig. 2),
- conductive particles (element 21, Fig. 2; conductive film on resin nucleus) with portions of their surfaces covered by insulating fine particles (element 20, Fig. 2 & 3; fine micro insulating powder),
- wherein said conductive particles have nuclei comprising a polymer(element 18,

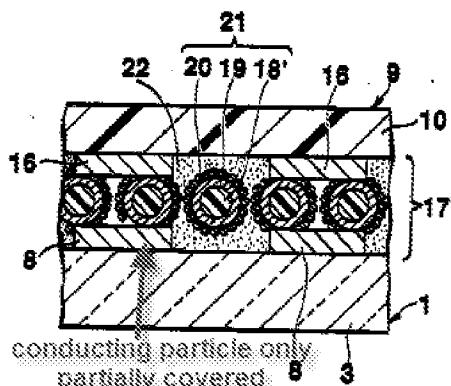


Fig. 2; column 5, lines 48-50; acrylic resin), remaining portions of surfaces of the conductive particles not being covered by the insulating fine particles (see below).

The recitation that "a first circuit member having a plurality of first circuit electrodes...second circuit member having a plurality of electrodes..." has not been given patentable weight because it has been held that a preamble is denied the effect of a limitation where the claim is drawn to a structure and the portion of the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951).

Sugiyama et al. does not teach wherein the mass of said insulating fine particles constitutes 2/1000 to 26/1000 or 7/1000 to 86/1000 (or specific gravity of 97/100 to 99/100) of the mass of said conductive particles.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have different ranges for the mass ratios of the insulating particles to the conductive particles, since it has been held that where the general conditions of a claim are disclosed in the prior art (column 13, lines 22-31), discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claims 4, 19, and 20, Sugiyama et al. discloses the claimed invention except for wherein in said covered particles, 5 to 60% of the surfaces of said conductive particles are covered by said insulating fine particles.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have range of coverage by the insulating fine particles, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claims 5, 21, and 22, Sugiyama et al. discloses the claimed (column 5 , lines 53-60; fine micro insulating powder is far finer than nucleus) inventions except for wherein the mean particle size of said insulating fine particles is 1/40 to 1/10 of the mean particle size of said conductive particles.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have different ranges for the mean particle sizes, since it has been held that where the general conditions of a claim are disclosed in the prior art (column 9, lines 26-32), discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding Claims 12, 35 and 36, Sugiyama et al. teaches a cured circuit connecting material according to claims 1, 2, and 3, and said first circuit electrodes and said second circuit electrodes are electrically connected through said covered particles (elements 8 & 16, Fig. 2).

Regarding Claims 13, 37 and 38, Sugiyama et al. discloses the claimed invention except for wherein, when a direct current voltage of 50 V is applied between adjacent circuit electrodes, the resistance value between said adjacent circuit electrodes is $10^9 \Omega$ or greater.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a voltage of 50 V applied to adjacent electrodes and resistance value of $10^9 \Omega$, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding Claims 15, 41, and 42, Sugiyama et al. discloses the claimed invention except for wherein the connection resistance between said first circuit electrodes and said second circuit electrodes is no greater than 1Ω .

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a connection resistance between the first and second electrode not be greater than 1Ω , since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding Claims 16, 43, and 44, Sugiyama et al. teaches wherein at least one of said first and second circuit electrodes comprises an electrode surface layer comprising at least one material selected from the group consisting of gold, silver, tin, platinum group metals and indium tin oxide (column 5, lines 5-7).

Regarding Claims 18, 47, and 48, even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product

was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding Claim 49, Sugiyama et al. teaches of a conductive connecting structure using conductive particles (element 21, Fig. 11) that are partially covered by the resin particle layer (element 20, Fig. 11; see below), in which the core material (element 18', Fig. 11) comprises a transition metal (column 9, lines 58-68; Titanium oxide, titanium being the transition metal).

Regarding Claim 50, Sugiyama et al. teaches wherein said conductive particles comprise particles having a nucleus of a polymer (element 18, Fig. 2) and an outer layer of precious metal (element 19, Fig. 2; column 5, lines 50-53).

Claims 6-11 and 23-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama et al. US 4,999,460 in view of Fukuzawa et al. US 5,162,087.

Regarding Claims 6, 23, and 24, Sugiyama et al. does not explicitly teach teaches wherein said insulating fine particles comprise a polymer of a radical polymerizing substance.

However, Fukuzawa et al. teaches wherein said insulating fine particles comprise a polymer of a radical polymerizing substance (column 9, lines 19-25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected the materials used by Fukuzawa et al. for their ease of assembly, reliable bonding, and insulating properties.

Regarding Claims 7, 25, and 26, Fukuzawa et al. teaches wherein said adhesive composition comprises a radical polymerizing substance and a curing agent which generates free radicals in response to heating (column 9, lines 19-25; column 11, lines 6-18).

Examiners note: It is known in the art that polymerization processes involve free radicals.

Regarding Claims 8, 27, and 28, Fukuzawa et al. teaches which further comprises a film-forming material comprising a phenoxy resin (column 9, lines 12-14).

Regarding Claims 9, 29, and 30, Fukuzawa et al. teaches wherein said phenoxy resin has a molecular structure derived from a polycyclic aromatic compound in the molecule (column 9, lines 12-14).

Regarding Claims 10, 31, and 32, Fukuzawa et al. teaches wherein said polycyclic aromatic compound is fluorine (column 9, lines 12-14).

Regarding Claims 11, 33 and 34, Sugiyama et al. does not explicitly teach a circuit connecting material according to claims 1, 2, and 3 formed into a film.

However, Fukuzawa et al. teaches of a conductive particle carrying adhesive formed into a film (column 11, lines 21-23).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the adhesive layer in Sugiyama et al. be formed into a film as an alternative and easier way of connecting the two circuit boards.

Claims 14, 39, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama et al., as applied to claims 1-3 above and in further view of Komatsu et al. JP 3112011 A.

Regarding Claims 14, 39, and 40, Sugiyama et al. discloses the claimed invention except for wherein at least one of said first and second circuit members is an IC chip.

However, Komatsu et al. teaches of anisotropic conductive material used to connect electrodes from a substrate to an IC chip (Abstract).

It would have been obvious to one having ordinary skill in the art at the time of invention to have one of the circuit elements in Sugiyama et al. be an IC chip, since the use of IC chips for multiple purposes is common in the art.

Claims 17, 45, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama et al., as applied to claims 1-3 above and in further view of Horiguchi et al. US 6,013,356.

Regarding Claims 17, 45, and 46, Sugiyama et al. discloses the claimed invention except for wherein at least one of said first and second circuit members comprises a board surface layer comprising at least one compound selected from the group consisting of silicon nitride, silicone compounds and polyimide resins.

However, Horiguchi et al. teaches of a circuit board insulating layer with high strength and reliability using silicon nitride as the insulating layer (Abstract).

It would have been obvious to one having ordinary skill in the art at the time of invention to have the board surfaces in Sugiyama et al. have a layer of silicon nitride for its insulating properties high strength and reliability.

Response to Arguments

Applicant's arguments filed 19 January 2012, with respect to the rejection(s) of claim(s) 17, 45, and 46 under 35 U.S.C. 103(a) have been fully considered in light of submission of the translated priority documents and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Horiguchi et al. US.

Applicant's arguments with respect to limitations as to the ratio of the size and weight of the insulating fine particles have been fully considered but they are not persuasive.

From MPEP 2144.05: A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). In this instant case, Examiner notes that controlling the mass ratio of the insulating fine particles to the conductive particles would produce a predictable result, such as increasing or decreasing the insulative properties of the bonding material.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HIRAM E. GONZALEZ whose telephone number is (571)270-1557. The examiner can normally be reached on Monday - Thursday 9:00-5:50.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thompson can be reached on 571-272-2342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HIRAM E GONZALEZ/
Examiner, Art Unit 2835

/Timothy J Thompson/
Supervisory Patent Examiner, Art Unit 2835